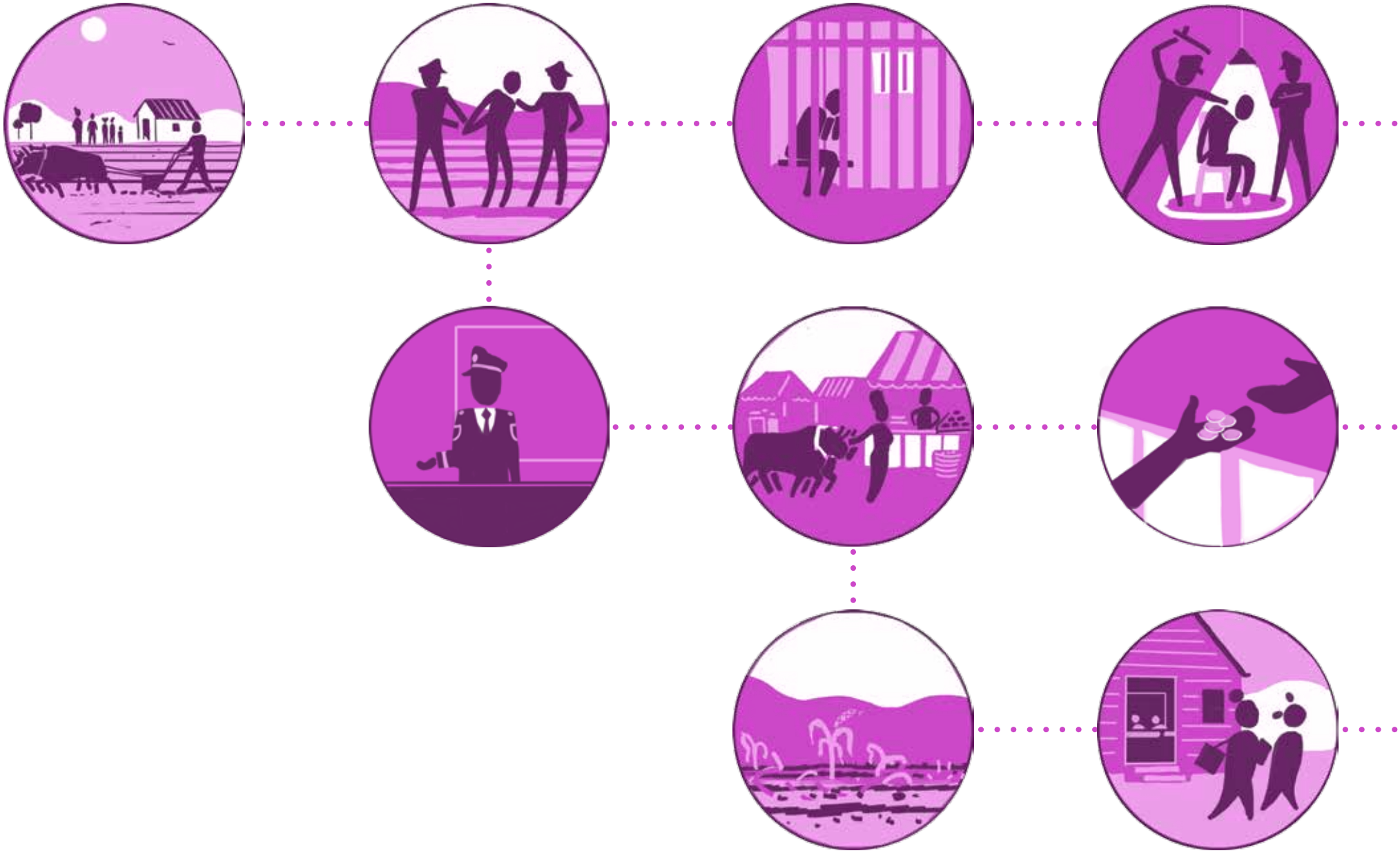
4 Chart Types



How to Use This Booklet

Data visualization can make information more memorable, more persuasive, facilitate understanding and ultimately motivate action. And within human rights research, it can help investigators and researchers draw a bigger picture from individual human rights abuses by allowing them to identify patterns that may suggest the existence of abusive policies, unlawful orders, negligence, or other forms of culpable action or inaction by decision-makers.

The purpose of this activity is to explore some of the ideas and principles around designing effective data visualization for human rights advocacy.

This activity is broken into a series of five steps each with its own PDF guide. The five steps are:

Step 1: Choose a human rights issue

Step 2: Discuss some kinds of data you might acquire

Step 3: Consider what question are you trying to answer with your data and visualization

Step 4: Choose a chart type for your visualization

Step 5: Consider some data and visualization hazards and ways your charts can be improved

Each step has a corresponding list of options and choices. Read through each step and follow the instructions. Explore the options for each step as you progress.

Step 4

Choose the best chart type

What are some chart types that best answer the questions you posed in step 3? Which charts are best suited to the kind of data you are using (continuous, categorical, discrete counts)?

Data visualizations are created using *visual encoding* to associate an aspect of the data with a visual characteristic like position, color hue or value, size, shape, orientation, etc.

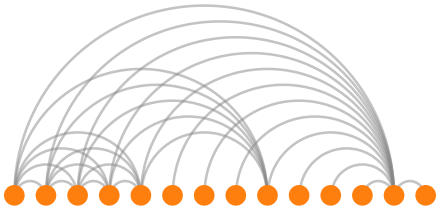
Visual metaphors and physical associations can also help interpret the data. For instance, similarity may be expressed as proximity, and larger amounts expressed as greater height or greater size.

In some cases icons, pictograms, or other kinds of illustration can help express the phenomenon or make a chart memorable.

We have included a variety of chart types in this exercise and some will be more familiar than others. We encourage you to explore.

For additional visualization types, visit The Data Visualisation Catalogue.

Arc Diagram



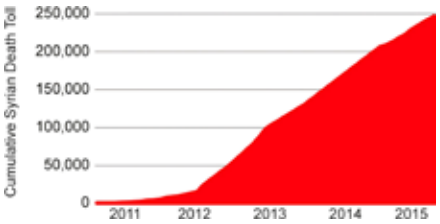
Arc diagrams are a method for representing network connections. Nodes of the network are displayed along a single axis (usually the horizontal axis) while the connections between them are displayed using arcs. Arc thickness can also be used to represent frequency between the source and node, enabling comparisons and finding co-occurrence between links.

Arc diagrams can provide of interrelated data, making it easy to identify clusters and relationships between links. Simple layout also makes it possible to display multivariate data alongside the nodes.

Arc diagrams can become cluttered and difficult to interpret when the data consists of a large number of connections.

In a complex layout with many overlapping connections, the one dimensional layout may not show connections between nodes as clearly as two dimensional charts.

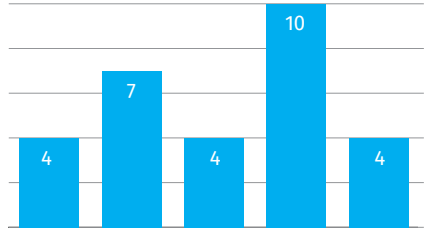
Area Graph



Area graphs display quantitative data over a continuous period of time, in a manner similar to the line graph. In an area graph however, the space below the line is filled with a particular color or texture. Area graphs are created by plotting data points on a grid (time is usually on the x-axis, with values on the y-axis), after which the points are connected with a line and the space below filled. Multiple data sets can be plot on the same chart for comparisons, using different fill colors or textures for each. Area graphs can show trending quantities, or even to compare the multiple quantities against each other.

See line charts or stacked area charts for comparing more than one quantity.

Bar Chart

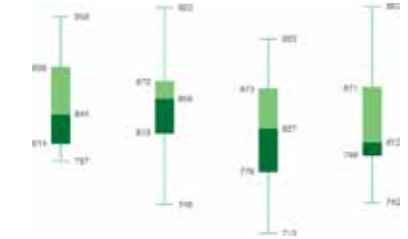


A bar chart (also known as a column graph) is a simple way to compare discrete, numerical data across categories, using horizontal or vertical bars. One axis shows the categories being compared, while the other axis displays the value scale. The length of the bar thus represents the value. As such, bar chart are useful for comparing different amounts against each other. Bar charts can also be used to display data over time, with the categories being months or years.

Bar charts can provide a clear comparison of different categories, and these categories can be qualitative or quantitative in nature. Bar charts can also be sorted as desired to show data in order of size, name, etc.

It can difficult to label the different bars when there are numerous categories.

Box & Whisker Plot



The box and whisker plot (also known as box plot) contains a 5-point summary of data points: the upper extreme, upper quartile, median, lower quartile, and lower extreme values. Through these five values, the box plot provides information regarding the variability and skewness of the distribution. The 'box' shows the median, and the two quartiles, with two lines extending from both sides (the 'whiskers') indicating the variability outside the quartiles. Multiple box plots can be drawn alongside each other to compare data sets. Box plots can be used to analyze the distributions over time, indicating changes in median values, variability in amounts, etc.

Bubble Chart

A bubble chart shows multiple variables, similar to a scatter plot. In addition to variables shown along the *x* and *y*-axis, dots on the scatter plot are replaced with 'bubbles', the size of which represents a third variable. By using different colors to distinguish between categories, a fourth dimension can also be displayed.

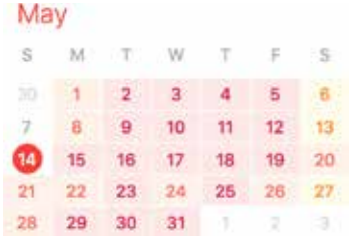
In the example above taken from gapminder.org, the x-axis indicates income per person, the y-axis indicates life expectancy, the bubble size indicating population, and color could indicate geographic region. The chart would show if a relationship exists between the four variables.

Bubble Map

Bubble maps are useful for comparing proportions and amounts against geography. Bubble maps are a variation of a bubble chart, with bubbles plot over geographical regions rather than the traditional Cartesian plane. The size or area of the bubble indicates the value of the particular variable, with the position on the map indicating location. The bubble map is effective when the effect of location on a particular variable is to be analyzed and comparisons need to be made. Plotting the number of projects, amount spent, or amount received on a bubble map can provide useful insights regarding where the organization must focus future efforts for example.

Bubble maps can become confusing, however, if very large bubbles overlap on the map. Comparing the scale of bubbles may also be difficult, but grouping data ranges into specific sized bubbles may help.

Calendar



A calendar shows time in chronological order, in order to help visualize the trends over time or to plan ahead. The most common type of calendar used internationally, the Gregorian calendar, divides time into years consisting 12 months, 52 weeks, 365 days. Each day is designated a unique date as identification. Calendars serve as a useful organizational tool, allowing events and meetings to be planned, projects to be tracked, future events to be identified, etc. Important events, meetings, and holidays can be marked on calendars and can be shared between teams in order to improve collaboration. A calendar is typically displayed as a grid, with a separate gird for each month, divided into seven columns, and five to six rows. However, the level of detail and format of a calendar is not fixed, and can be adapted based on requirements.

Shared calendars facilitate can collaborative planning. However, depending on the purpose, a balance is needed between detailed, daily view, or a broader monthly or yearly view.

Chord Diagram

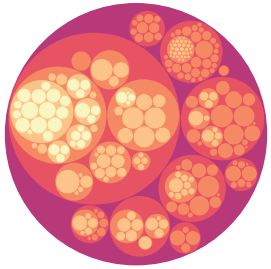
Chord diagrams visualize relationships between multiple entities. The chord diagram functions as a circle divided into categories, with 'chords' connecting different categories based on the relationship being analyzed. For example, a chord diagram can be used to analyze migration patterns among countries. The arcs on the edge of the circle would represent each country, with the arc length representing proportional value. Chords would then be used to connect one country to the other, in order to show the proportion of people who have migrated to and from each country. The thickness of the chord on each side represents the proportion of people who have migrated from the given country. We would thus be able to analyze important flow patterns as a result. Different colors can be used to group the data into categories and make it simpler to read.

Choropleth Map

Choropleth maps illustrate how data changes over geographical regions. The variable is categorized into intervals, with each interval represented by a color, and the map filled accordingly. Color progression is used to represent the differences, often blending from dark to light or one color to another. Progression should be limited to few shades that are easily distinguishable by the human eye in order to make the map easy to read. Choropleth maps can provide a big picture overview of data variability by location.

Choropleth maps work best when geographic regions are fairly consistent in size. Otherwise, larger areas appear more emphasized, which could result in misinterpretation.

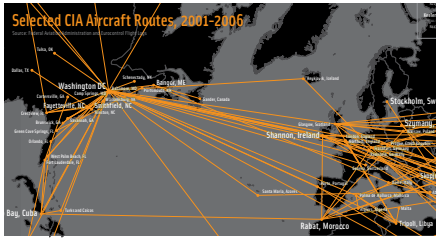
Circle Packing



Circle packing, also known as a circular tree map, is a variation of a tree map. It is thus a tool used to represent hierarchy and part-to-whole relationships. The primary difference between circle packing and a tree map is the use of circles to represent categories as opposed to squares. Circles are contained inside one another to display hierarchy. Similar to the tree map, the size of the circle represents quantity, while colors can be added to represent different categories.

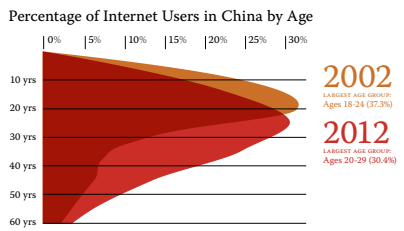
Circle packing can be used to show organizational structure, with circle area used to represent the number of employees and colors to represent different departments. However, circle packing is not as space efficient as tree maps or tree diagrams due to empty space between circles.

Connection Map



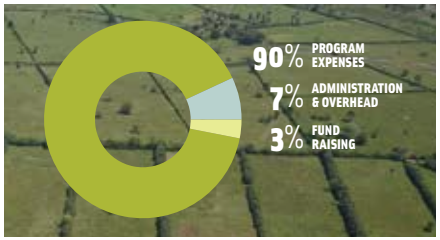
Connection maps, also known as a ray maps or a link maps, display connections between locations on a map. It can thus be compared to a flow map, which shows information/object flow from one location to the other, without the directional arrows, or varying thickness of connectors. Rather than indicating flow, the connection map simply highlights that the areas are linked to one another. The connection map can help identify patterns regarding the distribution of connections over geography. They can also be used to show how locations are connected through a chain of links, and are commonly used to display flight routes on a map. However, too many overlapping connections may cause confusion.

Density Plot



Density plots are useful for analyzing the distribution of data. Also known as a kernel density plot or density trace graph, the chart is a variation of a histogram. The chart displays the distribution of data over a continuous interval, smoothing out the noise in the data. This is done through 'kernel smoothing', in order to create a smooth line function for the data. As compared to a histogram which uses 'bins' to define intervals, the density plot uses a continuous scale along the x-axis. It thus provides a more clear representation of the distribution shape. Peaks of the density plot help indicate where data is clustered, similar to the way a histogram is read. The y-axis of a density plot is scaled so that the area under the curve is equal to 1. It is thus particularly useful to show probability distributions.

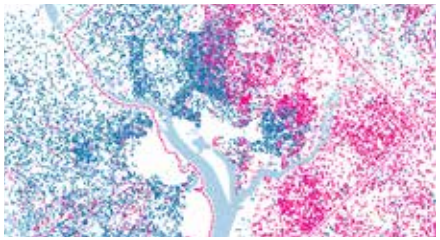
Donut Chart



The donut chart is a variation of a pie chart, with data split into categories based on proportionate value. A donut chart is thus essentially a pie chart with a hollow center. However, the length of the arc, as opposed to size of the slice shows the relative value of each category in the donut chart. The hollow center helps deemphasize the use of area to show the proportion split of data, and allows more categories of data to be displayed effectively. The donut chart is also more effective if comparisons are to be made across charts. Donut charts can also use the center space in for descriptive text if required.

As with pie charts, the circular form is aesthetically pleasing, however donut chats can only show a small number of slices before becoming confusing. Comparison between multiple donut charts would be needed to show trends in data.

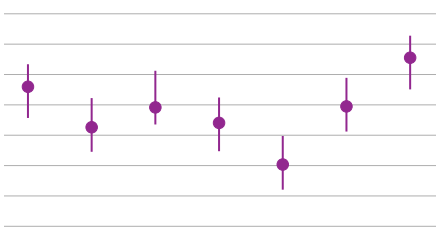
Dot Map



A dot map, also known as a dot distribution map or a dot density map, uses dots (or any other small shape) to mark the distribution of data over a geographical region. The point may represent a single unit, or may be keyed to represent multiple units. Differently sized points can also be used to indicate higher/lower frequency in an area, provided a legend is shown. Different shapes can also be used on a single map to indicate additional information.

Dot maps can provide useful information based on the pattern of clusters formed. Overlapping points may make the map difficult to read.

Error Bars



Error bars, are indicators used in combination with other chart types (such as scatter plots, bar charts or line charts) in order to display additional information. Error bars use small capped lines drawn over the original graph (from the center of a data point, parallel to the axis), showing the variability of the data point. The overall length of the line indicates how uncertain the data point is, and the length on each side shows if the data is skewed (data is skewed if length on both sides is unequal). A shorter error bar indicates the data is more reliable, while a longer error bar indicates higher variability and thus less reliability.

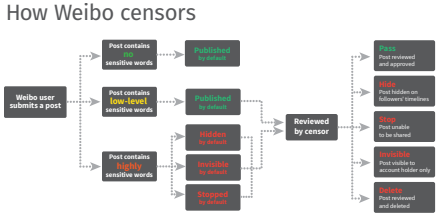
Error bars may contain some ambiguity as the measurement of error is not standardized (may measure standard deviation, standard error, confidence interval, etc.)

Flow Map

Flow maps are a combination of flow chart and map showing the movement of information or objects from one location to another. Arrows are used to represent the direction of movement from the point of origin, with the thickness of the arrow representing the quantity of the movement. An example of a flow map would be a map showing migration patterns, trade patterns, or even the flow of technology and ideas. Different colored arrows can be used on the same map to categorize the type of flow, and show movement of people and objects on a single map. However, it would not be advisable to combine too many variables on a single diagram.

Flow maps use the familiar arrow metaphor to communicate, though many arrows or overlapping of arrows may create confusion.

Flow Chart

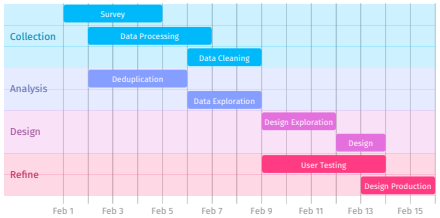


A flow chart, or work flow diagram, outlines the sequential steps of a defined process. Flow charts can effectively simplify complex or abstract procedures for communication.

The process is mapped out using connected symbols such as arrows indicating the direction of the next step. Boxes around steps sometimes use different shapes to differentiate the type of step. For instance: rectangles (process step), curved rectangles (start or end of process), diamonds (decision point), etc. These symbols are standardized in order to make interpretation of these charts easier. Details of each step are written within the symbols to clarify and explain the process. Flow charts can be used in either the planning/design phase of a process, or to explain an existing process to others. An example of a flow chart would be a chart outlining the steps to be taken for opening of a new bank account or registering a new customer. Flowcharts can become complicated if not structured logically or if arrows overlap.

4 | CHARTS

Gantt Chart



A Gantt chart is a kind of timeline that show bars extending horizontally to illustrate duration, with the different categories of task arranged vertically.

Gantt charts are a way of illustrating simultaneous timelines, as well as parts of an overall timeline.

Gantt charts are often used in project management to illustrate dependencies among smaller tasks that are part of the larger overall project goal.

4 | CHARTS

Heat Map

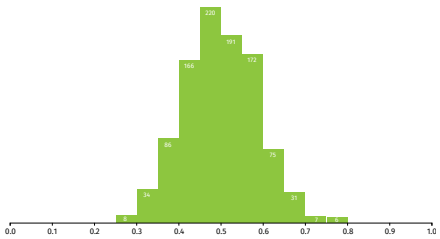
Heat maps are a way of illustrating a range of values using intensity or shifting hues of color over an area.

Heat maps are useful for displaying a range of intensities or clustering Heat maps using a rainbow color scheme, for example, would use darker blue areas to indicate low concentration of data points through green, yellow, and orange to areas of bright red to indicate the highest concentration. Areas without color would indicate an absence of data.

Heat maps can be used over a geographic map or a matrix or grid or even superimposed over an image. Popular uses of heat maps include locating large numbers of clicks on a web page, and to illustrate where people look in eye tracking studies.

4 | CHARTS

Histogram



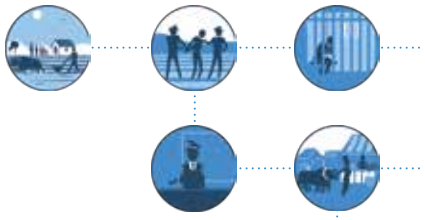
A histogram provides a visualization of the distribution of data over a specific period. Intervals or 'bins' are defined, with a count of the data falling within each interval plotted on the graph. Each bar thus represents the frequency of the data within the interval. A histogram is a useful tool to identify where values are concentrated, or if there are extreme values or gaps in the data.

An example of using a histogram would be to display the number of people who have made donations, against buckets of donation size over a specific period of time. This would show how donors are distributed, whether there are few donors who donate large sums, or if donations are evenly distributed.

Histograms provide a clear visual representation of the distribution of data, and can provide a rough view of the probability distribution.

Histograms can be used only with continuous data.

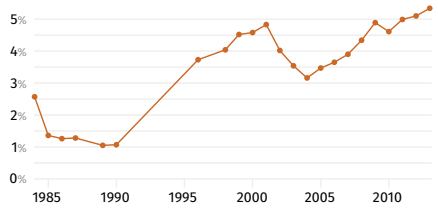
Illustration



An illustration diagram is displays a picture or image, along with labels that provide further information. Illustration diagrams can help explain complex ideas in a simple, engaging manner due to the strong use of visuals, narrative, and metaphor, and by breaking down complex concepts into small parts.

The image used can be in the form of a sketch, photograph, or symbols. Certain areas can be enlarged to show greater detail, or can be shown as a cross section to show parts that would otherwise be hidden from view. Illustration diagrams are useful to explain the parts of an object such as the parts of machinery in an instruction manual for example, or to show how things work or explain concepts. These diagrams are commonly used in school to teach students scientific concepts such as parts of the human body, individual cells, flowers, or the solar system for example.

Line Graph



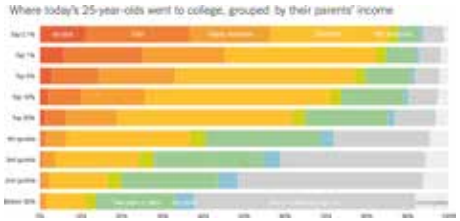
Line graphs are used to compare two variables, with one variable along the x-axis and another along the y-axis. While line graphs can be used to represent any two variables, they are commonly used to represent a change in one variable over a continuous period of time. For example, to show changes in quantity or percentage against time.

In addition to trends, line graphs can illustrate correlations between two variables, and how one changes with the other.

Multiple data sets can be compared using a line graph by plotting them on the same chart using different colored lines.

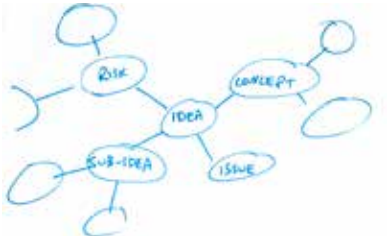
Too many data sets on a line graph can make it difficult to read due to clutter. Data sets with similar values cannot be easily distinguished in a line chart and may be compared more effectively using a clustered bar chart.

Marimekko Chart



Marimekko charts are used to visualize categorical data and relationships between categories and their sub-categories. They operate similar to a 100% stacked chart, with data on both axes adding up to form a whole. Both axes are equal in length and are scaled to represent 100% with equally sized segments. The chart thus has segments of varying height and width due to the two-dimensional representation of data. The Marimekko chart is thus effectively used to display any data that can be summed up in a cross tabulation. An example of a Marimekko chart would be to show how implemented projects are split across region (x-axis) and across different types such as education, health, etc (y-axis). The chart provides useful insights into distribution of data, relationships, patterns, and proportions.

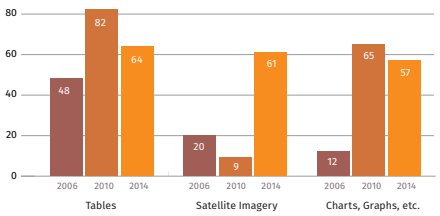
Mind Map



Mind maps are a kind of network diagram representing ideas and concepts and how they are connected. The mind map, sometimes called a 'brainstorm,' begins with a central idea, with categories extending out from this node. Further subcategories are extended from these categories, and so on. The diagram thus acts like a tree, with ideas stemming out from its branches, and sub branches. This tool is useful for idea generation, organizing thoughts, and structuring information and is thus useful in the initial stages of a project.

Mind maps can be used for a simple task such as writing a letter, or a complex task such as strategic analysis. Mind maps can be creates alone or in groups. In a workshop setting, collaborative mind maps are also effective in improving team work and generating consensus.

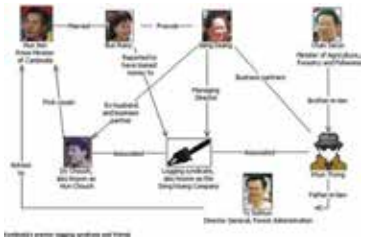
Multi-Set Bar Chart



Multi-set bar charts, also known as clustered bar charts, are a variation of a bar chart where two or more data sets are plotted side by side along a common axis. These are used to compare variables within the same category, and thus provides more information than a simple bar chart. The bars for each variable are shaded a different color, and a small space is given between categories, to make the graph easy to read.

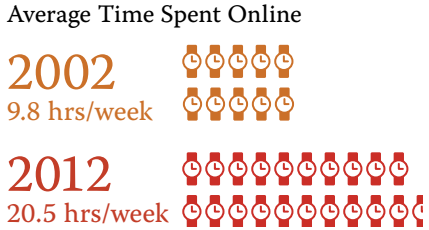
Bar charts are useful for comparisons among data sets or grouped variables within the same category type, though can become difficult to read if too many bars are used in a single group.

Network Diagram



Network diagrams visualize interconnections and relationships. They highlight interconnections between entities through the use of nodes and lines. Nodes are often drawn as circles, with links displayed as straight lines connecting the nodes. However, different icons and symbols can be used to represent different type of nodes. The length or thickness of the line, or the size of the node, can be used to represent additional information about the connection if required. Furthermore, the lines may have arrows indicating direction, or may be a simple line ('directed' or 'undirected' network diagrams respectively). Labeling is often required in order to clarify details if these additional variables are added to the diagram. Network diagrams can be used to show alliances, networks of corruption, or other social networks. Network diagrams can provide insights regarding structure and cluster patterns of network and can help identify the problem if there is a breakdown somewhere in the network. Network diagrams can become cluttered and hard to read as the number of connections and nodes increase.

Pictogram Chart



Pictogram charts use small icons to display the data, with each icon representing a certain value or category.

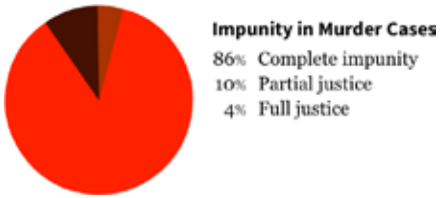
Icons are usually related to the data represented, making it easy to interpret, though annotation or a legend should explain the icon.

For example, a pictogram can be used to display the number of houses in different areas, with small icons of houses used to represent the quantity. Each house may represent a single unit or a number of units (as specified in the legend).

Pictograms add a level of visual narrative that may be useful when communicating across language or cultural barriers.

Adding too many different types of icons can quickly get confusing.

Pie Chart

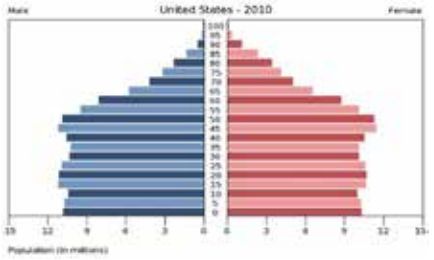


Pie charts show how data is split into sub-categories. Pie charts use subdivisions of a circle to visualize proportions, with the whole circle being equal to the total and sum of its parts. The parts of the whole are represented by slices of the pie with the angle, area, and arc length of each wedge used to represent the sub-section. An example of how a pie chart is used is the split of units by category.

Pie charts represent the percentage split of the data as opposed to the numerical values, though numerical values can be appended in annotation.

Pie charts are a fairly common chart type and benefit from this familiarity. However, representing more than a few categories makes the chart difficult to read. Pie charts are not suited for showing trends, and it can be difficult to compare multiple pie charts.

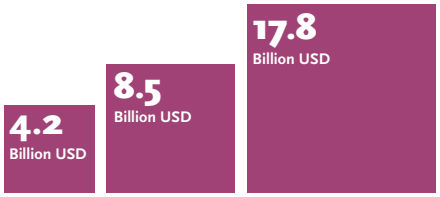
Population Pyramid



A population pyramid displays the population distribution across all ages, for both sexes. The chart can help identify and project future trends.

The population pyramid is a specific type of histogram, or rather a pair of histograms, positioned back to back. Each histogram shows the frequency distribution of the population across age brackets (one for males and the other for females). Population pyramids are useful in fields such as economics, sociology, and ecology as they help indicate population patterns and future trends. A population pyramid with a wide base and narrow tip for example indicates a young, dependent, population, with high fertility rates and low death rates. Future trends are also speculated using these charts.

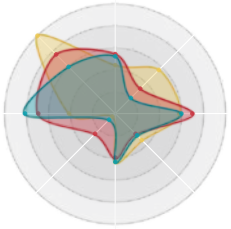
Proportional Area



A proportional area uses shapes to compare qualitative data through the relative size of each shape. Common shapes used are squares, rectangles or circles, as they are easy for the human eye to compare. Multiple data sets can also be plot on the same area chart in order to represent sub-categories and provide further detail about the data.

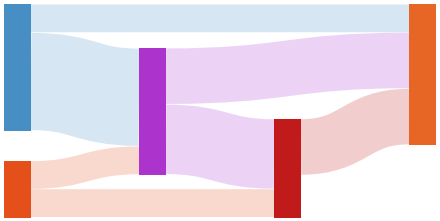
Proportional area charts can communicate a 'big picture' overview and relative differences between areas, but are hard to read with precision.

Radar Chart



Radar charts display and compare multiple quantitative variables. The variables are provided axes, each of which may have a different scale, and are arranged in a circular form. The chart is ideal for measuring 3-8 variables, as it becomes difficult to read as more axes are included. Data points are plotted along their individual axes, with lines connecting the points to form a polygon. Multiple data sets can be plot against the same chart, with each being marked a different color.

Sankey Diagram



Sankey diagrams are a specific form of flow diagram, showing the movement direction and flow quantity through arrows. The thickness of the arrows shows the proportional flow quantity relative to other arrows. Flow arrows can combine or separate their paths as they move along a process, and colors may be used to show different categories of movement, or to separate different stages in a process. The total inflow shown in a Sankey diagram should generally equal the total outflow. It is thus useful to visualize the transfer of energy, money, or materials. Such maps provide useful insights regarding the pattern of flow, where it is clustered, how much is being wasted, and so on.

Satellite Image

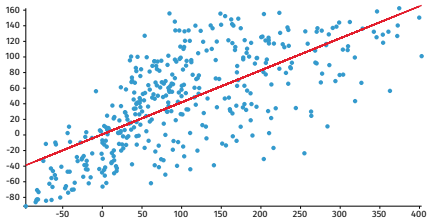
Images taken by satellites can provide useful context and analysis for human rights reports. Satellite images have been used to show where incidents have taken place, where researchers have visited, and as a base map for pointing out other sites of importance.

Satellite imagery has been a particularly powerful tool for showing large scale infrastructure changes before and after human rights incidents, for instance, the destruction of housing or the growth of refugee camps or other informal housing.

Analysis of infrared satellite imagery can illuminate changes to vegetation due to a drought or reveal tracks of vehicles through fields.

Since the 1990's, high quality satellite imagery has become increasingly available to the public through web-based mapping programs as well as desktop GIS applications and Google Earth.

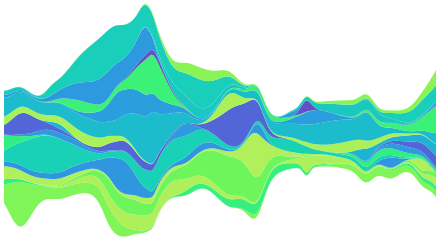
Scatter Plot



A scatter plot, or X-Y plot shows the relationship between two variables, x and y. The two variables are displayed on the two axes, with data points plot on the grid. In this way, one can sometimes see clusters or trends within the data.

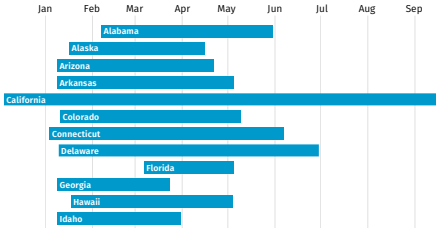
A regression line, sometimes called a 'trend line' or 'line of best fit' is drawn as close to the points as possible. This line helps determine if there is any correlation between the two variables, and if there is, whether it is positive or negative.

Stream Graph



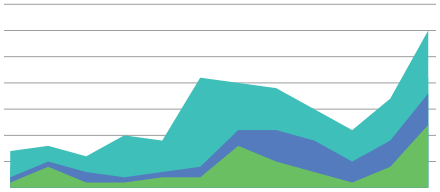
A stream graph, also known as a theme river, is a modification of the stacked area graph. Rather than plotting values against a fixed, straight axis, the values are displaced along a central baseline. The final output thus resembles a flowing river. The axis parallel to the 'stream' indicates time (can be daily, monthly, yearly, etc.), while the height of the area indicates value. Different colors/textures can be used to represent multiple data sets on a single graph, making it easy to compare trends. Stream graphs can be used to visualize the quantity changing within categories over time with the area of each indicating the variability. Stream graphs are can help identify patterns and seasonality.

Span Chart



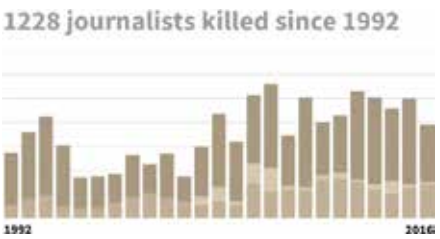
Span charts, also known as floating bar graphs, or difference graphs, illustrate the range of a data set. Rather than focusing on a single value, these charts show the maximum and minimum values a data set takes within a given period. This information can be compared to other data sets within the same period, or across periods.

Stacked Area



A stacked area graph is a modification of a simple area graph, with multiple data series plot on top of each other. The second data series thus starts from the point left by the first, and so on. The area below each line is filled using a different color/texture to make the chart easy to read. The chart is also similar to stacked bar charts, as both show subcategories adding up to a total. A stacked area graph would be effective to compare multiple variables over time, particularly if they are related. A variation of the stacked area chart is the 100% stacked area chart, which focuses on how the percentage of each subcategory to the whole varies over time.

Stacked Bar Graph



Stacked bar graphs are a variation of a bar chart where each bar is segmented into its sub categories. Each bar is thus visualized as a sum of its components, with data values stacked on top of each other.

An example of a stacked bar chart would be to show the breakup of incidents by type, and how these change over time. This would provide key information regarding how total changes, as well as how the individual categories change.

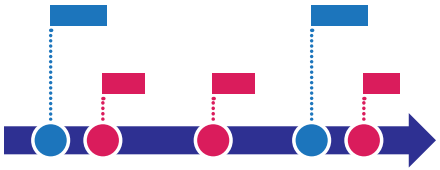
A variation of the stacked bar chart is a Marimekko chart, a type of stacked bar chart which shows the percentage split of each group so that all the segments add up to 100%.

Comparing segments may become difficult as they do not have a common baseline (comparing segments is easier in a 100% stacked bar chart as the segments are proportionate to the whole.)

Sunburst Diagram

Sunburst diagrams are also known as ring charts or multi-level pie charts. The diagram shows hierarchical relationships through a series of rings moving outwards with each level of hierarchy. The rings of a sunburst diagram are slices to represent sub-categories within each level. The central circle represents the 'root node', with each slice extending from the central circle a 'child node', representing a part-to-whole relationship. The slices of the rings can be either split equally, or be split proportionate to value in order to represent a quantitative variable. Colors can be added to the diagram to categorize variables or to group variables. It is possible for one slice in a ring to have further 'child nodes', giving the chart an uneven appearance.

Timeline



Timelines display events in sequential order. Timelines are suitable to display any quantitative or qualitative information related to time. They are especially effective in communicating a story, visualizing history, or analyzing a sequence of events. Timelines may be scaled to show equal gaps between equal periods of time, or may act as a simple list of events in chronological order. Timelines can be combined with a graph to effectively show quantitative data over time.

Some interactive timelines allow the user to zoom in and out of dense clusters of data for a finer grained view.

It has become a convention for timelines to move from left to right, though vertical timelines work particularly well on the web. Radial timelines may be suitable for visualizing daily, seasonal, or other cyclical patterns of data.

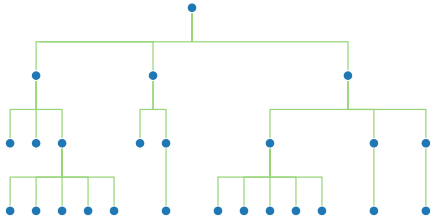
Time Table

A timetable is a more detailed form of a calendar, with each day divided into periods of time (usually hours, but can be any other division of time as well), and events or tasks marked against each period. Timetables may be daily (with the same schedule followed each day), or weekly (with a different schedule for each day in the week). When specific times are to be noted rather than periods of time, the timetable often takes the form of a list of events, with the time marked next to each event.

Timetables can be useful for time management, and personal planning, or widespread communication and mobilization, for instance scheduling events, tasks, meetings, etc.

Some examples of timetables are the event plan for a conference, or the start and end timings of human rights incidents.

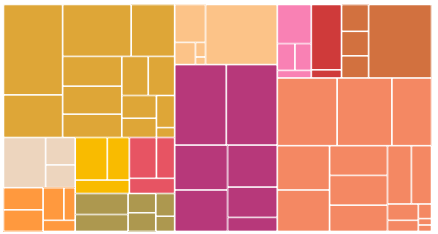
Tree Diagram



Tree diagrams are methods for illustrating hierarchy. The diagram is a tree-like structure, with connecting lines extending from a central node. The central node is often referred to as the 'root node', the connecting lines as 'branches', the connected members as 'nodes', and finally the 'leaf nodes' being the members with no further extensions. Simple shapes such as rectangles or circle are commonly used as nodes, with descriptive text within or underneath the shape.

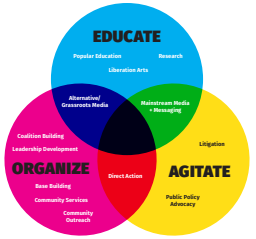
Tree diagrams are effective means to display organizational hierarchy such as a chain of command, and they provide clear information regarding reporting lines and departmental structure. They can also be used to visualize family relations and decent, which is known as a 'family tree'.

Tree Map



Tree maps are a variation of a tree diagram, used to represent hierarchy. The tree map represents hierarchal structure, while using the size or area of the squares to represent quantity. Each category is assigned a rectangle, with subcategories displayed inside the large rectangle, in proportionate size against each other. The area of the parent category is thus a sum of its sub-categories, with a clear part-to-whole relationship displayed. No connecting lines or branches are required, as in the case of a tree diagram. The shapes within the tree map are created using coding algorithms, and thus need special software. A tree map can be used to illustrate relative expenditures within a budget, with the area of the squares representing number of amounts allocated to each budget category.

Venn Diagram



Venn diagrams, or set diagrams are useful for the visualization of relationships between sets. Venn diagrams often use circles to represent sets, with overlapping of circles to show data that is in common between the sets. This area of overlap is known as the area of intersection. The sets can be any collection of objects or data. The size of the circle can be used to show the proportional size of each data set as added information, along with text labels and different colors for different sets. Venn diagrams can effectively be used to show relationships between multiple sets, though can become complicated if too many sets are used in a single diagram

Image Sources

Area Graph:
"Iconic photographs and the ebb and flow of empathic response to humanitarian disasters"
Paul Slovic et al

Chord Diagram:
The Global Flow of People
Nikola Sander, Guy J. Abel & Ramon Bauer

Circle Packing:
Mike Bostock

Donut Chart:
Fund for Global Human Rights

Flow Chart:
The Committee to Protect Journalists,
John Emerson

Gantt Chart:
Jess Peter

Heat Map:
Journalists and media support worked killed during tenure of President Felipe Calderón Hinojosa. Data: The Committee to Protect Journalists, Graphic: John Emerson

Illustration:
John R Holmes from *Presumption of Guilt: The Global Overuse of Pretrial Detention*, Open Society Foundations Justice Initiative

Marimekko Chart:
The New York Times

Network Diagram:
Cambodia's Family Trees. Global Witness

Population Pyramid:
U.S. Census

Radar Chart:
Nadiah Bremer

Sunburst Diagram:
Mike Bostock

Stacked Bar Graph:
The Committee to Protect Journalists,
John Emerson

Tree Map:
Mike Bostock

Venn Diagram:
John Emerson

Additional Resources

The Data Visualisation Catalogue, an extensive list of visualization types.

Graphic Continuum Flash Cards by Jon Schwabish and Severino Ribecca

Which chart or graph is right for you? from Tableau

dataviz.tools, a curated list of tools, resources and technologies for data visualization

Tableau Training & Tutorials, how to create and share data visuals using Tableau

The Noun Project, free and Creative Commons licensed icons and pictograms, searchable by topic

Visualization Tools for Investigators platform to help map complex business or crime networks

QGIS, powerful open source desktop GIS tool with an extensive suite of plugins

Carto map and analyze location data. Multiple product levels

Mapbox, platform to build maps for online and mobile apps

About this Booklet

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The booklet was authored by John Emerson and Margaret Satterthwaite with help from contributors Brianne Cuffe and Sidra Mahfooz.

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For more information about data visualization and human rights along with links to resources, research and tools, visit our project page at http://visualizingrights.org.

Please send suggestions, comments, or feedback to john@backspace.com

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